

Galaxy Evolution in High Definition Via Gravitational Lensing Jane Rigby (NASA Goddard Space Flight Center)

In hundreds of known cases, "gravitational lenses" have deflected, distorted, and amplified images of galaxies or quasars behind them. As such, gravitational lensing is a way to "cheat" at studying how galaxies evolve: lensing can magnify galaxies by factors of 10--100 times, transforming them from objects we can barely detect to bright objects we can study in detail. I'll summarize new results from a comprehensive program, using imaging from Hubble and Spitzer, and high-quality spectroscopy from Keck, Magellan, and Hubble, to study how galaxies formed stars at redshifts of 1--3, the epoch when most of the Universe's stars were formed. For lensed galaxies, we can obtain spectral diagnostics that are currently unavailable for the distant universe, but will become routine with next-generation telescopes. These results give insight into the process by which galaxies form elements and stars.